TRANSACTIONS
OF THE
ILLUMINATING ENGINEERING SOCIETY

FOUNDED IN LONDON 1909

INCORPORATED 1930

CONTENTS

	Page
Presidential Address, by J. W. T. Walsh, M.A.,D.Sc. *(Fellow)* -	149
Sessional Meeting in London -	155
Provisional Syllabus of Meetings	156
Further Recommendations to Authors	162
Additions to List of Members -	163

VOLUME XII.
No. 7 — 1947

32 VICTORIA ST
LONDON, SW1

Annual Subscription to Non-Members - £2.2.0
Price per Number to Non-Members - 5s. 0d.

SESSION 1947—1948

THE I.E.S. COUNCIL

President:— J. W. T. WALSH, M.A., D.Sc., F.I.E.S.

Vice-Presidents:—J. M. WALDRAM, B.Sc., F.Inst. P., F.I.E.S., J. S. PRESTON, M.A., M.I.E.E., F.I.E.S., E. C. WALTON, B.Eng., Ph.D., A.M.I.E.E.

Members of Council:*—

Elected Members:—

J. N. ALDINGTON, C. J. ALLDERIDGE, C. R. BICKNELL, H. BRIGHT, L. J. DAVIES, C. E. GREENSLADE, W. M. HAMPTON, A. G. HIGGINS, T. S. JONES, S. D. LAY, H. A. LINGARD, E. W. MURRAY, J. H. NELSON, A. J. P. PASHLER, A. G. PENNY, E. B. SAWYER, J. S. SMYTH, J. F. STANLEY, W. R. STEVENS, W. S. STILES, P. C. SUGG, F. WALKER, W. D. WRIGHT.

Ex Officio Representatives of Centres:—

E. A. NEWBURN (*Bath and Bristol*), W. J. P. WATSON (*Birmingham*), J. TREVOR JONES (*Cardiff*), PROF. M. G. SAY (*Edinburgh*), V. P. MACNAUGHTON (*Glasgow*), W. CHARD (*Gloucester and Cheltenham*), E. A. FOWLER (*Leeds*), J. G. EVERETT (*Leicester*), T. R. JONES (*Liverpool*), J. H. MORRISON (*Manchester*), C. FIELDING (*Newcastle*), J. C. CHARITY (*Nottingham*), E. G. R. TAYLOR (*Sheffield*).

Hon. Treasurer:—
J. G. HOLMES.

Hon. Secretary:—
H. C. WESTON.

Hon. Editor of Transactions:—S. ENGLISH.

Secretary:—G. F. COLE.

*In addition, all Past Presidents of the Society are *ex officio* Members of Council.

Committees

GENERAL PURPOSES COMMITTEE: J. W. T. Walsh (*President*), J. G. Holmes (*Hon. Treasurer*), H. C. Weston (*Hon. Secretary*), J. S. Dow (*Past President*), J. M. Waldram, J. S. Preston (*Vice-Presidents*), E. C. Walton (*Nth. Midland Area*), C. J. Allderidge (*Midland Area*).

PAPERS COMMITTEE: C. R. Bicknell, L. J. Davies, T. S. Jones, A. G. Penny, J. S. Preston, F. C. Smith, W. S. Stiles, P. C. Sugg, J. M. Waldram.

EDUCATION COMMITTEE: R. O. Ackerley, A. Cunnington, P. Good, C. E. Greenslade, A. G. Higgins, W. J. Jones, S. D. Lay, J. T. MacGregor-Morris, F. C. Smith, W. R. Stevens, J. W. T. Walsh.

I.E.S. CODE COMMITEE: R. O. Ackerley, C. R. Bicknell, T. S. Jones, E. B. Sawyer, F. C. Smith, J. S. Smyth, J. F. Stanley, W. R. Stevens, J. W. T. Walsh.

DEVELOPMENT COMMITTEE: R. O. Ackerley, C. J. Allderidge, A. G. Higgins, T. R. Jones, T. S. Jones, A. G. Penny.

AREAS JOINT COMMITTEE: One representative from each Centre.
Council's Representatives: J. H. Nelson, E. B. Sawyer, E. Stroud.

(N.B.—The President, Hon. Secretary and Hon. Treasurer are *ex officio* members of all committees.)

Presidential Address*

By J. W. T. WALSH, M.A., D.Sc. *(Fellow)*.

The Training of the Illuminating Engineer

In years gone by, as some of us remember, our founder, Mr. Leon Gaster, used to emphasise the fact that the title of the Society was the Illuminating Engineering Society and *not* the Society of Illuminating Engineers. It was his boast that anyone, whatever his calling or profession, could join the Society so long as he was interested in the subject of illumination. In other words the Society was wholly cultural in character and made no attempt to join the ranks of the professional institutions.

The many advantages of that position were ably set out by my predecessor in his presidential address a year ago and it is a source of great satisfaction, particularly to the older members, that nothing has occurred which would in any way narrow entry into the Society's ranks. Membership is still open to all and we are glad to number amongst us many eminent members of the old and honoured professions. At the same time, recent progress in the art and practice of illuminating engineering has been so great (and I think we may not unjustifiably take pride in the part the Society has played in stimulating that progress) that there has arisen a new profession—the profession of the illuminating engineer or, as some of us would prefer to call him, the lighting engineer.

The first effect of this on the structure of the Society was the institution in 1940 of a new grade of membership, the Fellowship, which is granted to those who have achieved some degree of eminence in the lighting world, either as practising illuminating engineers, as research workers, as teachers or as workers in other branches of our subject. This departure did not, however, meet the need that was widely felt for some hall-mark that a member of the Society was competent in the field of lighting practice, something that would serve to distinguish him from the member who was only interested in the subject of illumination. It was pointed out that such a hall-mark would be of great benefit, not only to the holder but to those who wanted the services of a lighting engineer and who had no other means of distinguishing the expert from the incompetent or, still worse, from the charlatan. For example, the Society had for a long time urged that architects should consult an illuminating engineer when designing lighting systems for their buildings. It had also repeatedly emphasised the need for large supply undertakings, whether gas or electric, to have on their staffs men who were qualified to advise on lighting matters and, if need be, to undertake the design of lighting installations. The question was asked, how could the architect or the supply undertaking make sure of securing the services of a competent lighting engineer?

In the other professions there were bodies who took upon themselves the task of ensuring that, as far as was humanly possible, only those were admitted to membership who were competent in their profession. In other words, these bodies were professional institutions and not primarily cultural societies. Here, then, was a dilemma. Should the Illuminating Engineering Society change the basis on which it had worked so long and so successfully; should it cease to admit any but the professional illuminating engineer; or should it retain its status as a cultural society and not attempt to apply any sort of professional

* Presented at a meeting of the Society on Tuesday, October 14, 1947.

hall-mark to those of its members who were, in fact, engaged in this new and growing branch of the engineering profession?

Fortunately a compromise was found and, as you know, it has been decided to retain the original status of the Society but at the same time to provide a hall-mark which, while in no way a condition of membership, can serve as a guarantee that the possessor is a competent lighting engineer.

In the last sentence the word "guarantee" is used, and in that word lies the keynote of this address. If this hall-mark is to be of the greatest possible value, not only to its holder but to the Society and to the world at large, the basis on which it is granted needs most careful thought and, it may well be, much expenditure of time and trouble on the part of many of our members.

In the first place we must ask: What are the qualifications we expect of a competent lighting engineer? It is clear that he must have a good educational background, as in all other professions. Then he must have a sound theoretical knowledge of the fundamentals of those subjects which principally underlie illuminating engineering, particularly light, mathematics and electrical or gas engineering.

At this point it may not be out of place to refer to a statement in the preamble to the syllabus of the City and Guilds examinations in illuminating engineering, viz. that "students entering upon the Intermediate course should normally have studied mathematics to the standard of a Third Year Senior Course and engineering drawing to that of a First Year Course. Similarly, a knowledge of elementary chemistry, also of light and electricity up to the Intermediate B.Sc. standard, together with some acquaintance with the principles of alternating currents, is essential." It cannot be too strongly emphasised that early specialisation in illuminating engineering, before a really adequate background in all the basic subjects has been obtained, can only lead to difficulties at a later stage and should be most severely discouraged. Finally, as far as the more theoretical side of his training goes, the would-be lighting engineer must know the principles which underlie the practice of his chosen profession. He must understand the various methods of light production, and know something of the behaviour of the eye and of the principal quantities used by the illuminating engineer and how they are measured. He must know the theoretical bases upon which illumination systems are designed and be familiar with the principles of design of the apparatus used. In a few words, he must have at least enough knowledge of the theory of his subject to be able to pass the Intermediate Grade of the City and Guilds examination.

All this is fairly plain sailing. There are now courses of study open to the student who wishes to prepare himself for the City and Guilds examination and, for new entrants to the profession at any rate, there should be no difficulty in demanding this standard at least, as a first qualification. It is at the later stage that difficulties begin to arise, and I should like to make it clear that in all that follows I am expressing mainly my own personal opinions and cannot in any degree claim to speak for the Society.

May I say at the outset that I hope the Society will pitch its demands high? I believe it is most important that the profession should quickly come to be recognised as one demanding a severe discipline on the part of those entering it. I would discourage anyone from making the attempt who was not prepared for at least five years of part-time study on the theoretical side, after attaining the school certificate, and for a practical training covering that period and at least three further years of more advanced and responsible practice under the eye of a qualified lighting engineer.

As a guide to what, I believe, the Society might well demand on the

theoretical side, following the City and Guilds Intermediate, we may look at the syllabus of the Advanced Grade examination, Section A. It will be clear that this involves a more detailed study of what was included in the earlier examination as regards the various modes of light production, the properties of radiation, the behaviour of the eye, particularly the phenomena of colour vision, the practice of photometry, both visual and photoelectric and, in short, all that the illuminating engineer should know of light and vision as a basis for his practical work.

The other part of the Advanced Grade, Section B, links up more closely with what we may call the "field work" of the illuminating engineer, and it may be well to look at this part of the syllabus in more detail as it is a valuable guide, not only to the examination content, but also to the kind of practical experience the student should be expected to acquire.

Many students might, perhaps not unnaturally, be surprised at the inclusion of a study of daylight among the requirements for this section. If so, a word or two explaining the value of an elementary knowledge of this subject for *all* lighting engineers may not be out of place. To start with, it is, of course, the form of illumination with which every architect is necessarily concerned in the design of nearly every building, and it is therefore only to be expected that he will take it for granted that the professional lighting engineer should know more than he does about the principles and practice of the daylighting of rooms. Then there is the subject, now coming into great importance, of admixture of daylight and artificial light. I don't want to enter now into what is almost certain to be a highly controversial subject in the immediate future and probably for some time to come, but the point I wish to make is that any lighting engineer is likely to have to deal with a problem of "mixed lighting." In order that he may be in a position to give the best advice he must have at least a good working knowledge of daylight and its variations and how, for example, it is affected by window design and by the possible future erection of buildings in the neighbourhood. I think every student, without exception, should, during his training, assist in the preparation of a thorough survey of the daylight conditions in an office or workshop.

Another heading in the syllabus for the Section B examination is the calculation of illumination due to point, line and surface sources. Again the student may be tempted to think that such work is of the nature of an academic exercise rather than the sort of problem that he is likely to meet in his future career as a practising lighting engineer. If he does think that he is forgetting the modern growth of interest in built-in lighting, with its panels, its light pillars and similar features or, alternatively, he may hope to get by with a rough adaptation of the lumen method of calculation in circumstances which make it quite inapplicable.

Then there is the clause which requires the student to know something of the influence of lighting requirements on architecture and building construction. I think that a word of caution may be necessary here. No doubt he will appreciate the necessity for such knowledge when he is called upon to advise an architect on the lighting systems for some proposed building, but there may be a danger that he will presume on his knowledge to attempt to dictate to the architect in the latter's own particular domain. I hope you will forgive me if I quote from something I have written elsewhere on this particular subject. "The creation of something aesthetically pleasing is primarily the function of the artist. An engineer is generally not an artist, either by instinct or by training, and it is therefore best for him either to follow, more or less closely, lines which have been proved to lead to satisfactory results or, if the

installation is a large one, calling for individual treatment, to ally himself with the artist at an early stage in the design. In the case of a new building, especially, the lighting should be planned by the architect and the illuminating engineer in collaboration, while the building is still in its formative stages on the drawing-board." Perhaps the chief advantage which an elementary knowledge of architecture gives to the illuminating engineer is that it enables him to grasp more readily the architect's aims and intentions; it should, at the same time, give the architect confidence that his adviser in the lighting field is aware of the practical limitations of his medium.

The most obvious vital parts of the syllabus of Section B are those which demand a fairly complete knowledge of the way in which lighting installations are planned and of the requirements in special classes of installations such as street-lighting, factory lighting and the lighting of schools, shops, offices, etc. This section requires careful consideration from the point of view of the student's practical experience. Although it would probably be agreed that active participation in the design of installations of all kinds is desirable, it is probable that experience in two or three of these fields is all that can reasonably be expected.

In particular, opportunities for practical experience in the design of street lighting installations are not likely to be available to more than a small fraction of students. That branch of illuminating engineering is, in any case, somewhat specialised and no student could be disqualified for receiving the hall-mark of competence from the Society because of lack of experience in this type of work. On the other hand every lighting engineer is likely to be called upon to design an installation for a factory, a shop or an office and lack of experience in such work would be a very serious handicap.

This raises what is perhaps the most difficult problem in the application of any scheme for conferring a hall-mark. It seems more than likely that a number of those who are undergoing training may well find themselves in an organisation which specialises to a greater or less extent in one or two branches of lighting practice and therefore provides no opportunity for experience in the other branches. This is, of course, no new problem. In other connections it is sometimes solved by the individual, who changes his job in order to broaden his experience, spending some of his earlier years with one organisation and the remainder with another covering a different type of work. Sometimes, of course, in the larger organisations all types of lighting are dealt with, although in different departments, and it is then possible, by suitable transfer from one department to another, for the student to gain the whole of his practical experience without a change of employer.

It is at this stage that I want to make a very strong appeal to our sustaining members. If we look at the first few pages of the Society's membership list, we notice the names of a large number of the leading organisations in the lighting industry. The opportunities which these organisations could afford to the illuminating engineer in training must, in many cases, be sufficient to cover all the requirements which I have endeavoured to sketch out. In other cases it might be necessary for the trainee to get part of his experience with one organisation and the rest with another. In the first case, I want to appeal to our Sustaining Members for a deliberate and thorough-going policy aimed at ensuring that every member of the staff who fulfils the other necessary conditions should not be debarred, by gaps in his practical experience, from qualifying for the hall-mark offered by the Society. In the second case, I want to appeal for breadth of vision and a willingness to accept the need for a change

from one firm to another on the part of the trainee and, in fact, active encouragement to him to make such a change at a suitable stage in his training. I can conceive it as possible that several of our Sustaining Members may arrange, either by themselves or through the Society, an interchange scheme to ensure that, as far as possible, a good all-round practical experience is available to anyone who desires to enter the profession under their respective auspices. Such an arrangement would clearly be greatly to the ultimate benefit, both of the individual and of the profession as a whole and I am certain it is not too much to hope that this consideration will outweigh the obvious temporary disadvantages to the organisations concerned.

I have said nothing so far about the release of trainees during working hours for the purpose of taking the courses of instruction needed in preparation for the City and Guilds examinations. Such release is, of course, very much in line with the practice in other branches of engineering and with the educational policy incorporated in the 1944 Act, and I therefore assume that it will be the rule rather than the exception in the lighting world.

There is one difficult problem which faces a not inconsiderable number of would-be students of illuminating engineering and that is the lack of instruction classes within a reasonable distance. For such students, private study, with or without the help of a correspondence course, seems to be the only solution though, here again, the organisation in which the student is employed may be able to be of considerable assistance. In most cases, there will be a senior on the staff who is a fully-trained and practising illuminating engineer and a little encouragement from the management is probably all that is needed to ensure that the student does not find himself entirely without a "guide, philosopher and friend" when he is tackling the theory that lies behind the practice he is learning day by day on the job. Again, I feel sure that this further appeal to our Sustaining Members for a far-sighted policy will not fall on deaf ears.

Now in the few moments remaining to me I want to turn to two other matters. One of these, although not directly concerned with the training of the professional illuminating engineer is nevertheless very much concerned with professional training in the subject of illumination. I refer to the inclusion of a knowledge of lighting in the syllabus of training for those other professions whose members are most likely to be confronted with lighting problems, viz., the architects, and the gas and electrical engineers.

I believe it is the general opinion of those architects who have studied the matter, that more attention to lighting, both natural and artificial, would be very desirable in the syllabus of training for the architectural profession. In fact it was a recommendation of the Committee which drew up the Report on the "Lighting of Buildings" "that the Board of Architectural Education and the Town Planning Institute should include a study of lighting in the subjects for their qualifying examinations," just as they recommended that "the training of Illuminating Engineers should include suitable instruction in building practice and design."

As regards the professional bodies in the gas and electrical industries I think it is justifiable to remark that the growing importance of lighting has not been fully recognised as far as the place accorded to it in the examination syllabuses of those bodies is concerned and I venture to express the hope that at no very distant date, the electrical or gas engineer who hopes later to make lighting one of his major interests will be more adequately catered for than he is at present.

Then, lastly, I want to mention the teaching of the elementary principles

of good lighting to the whole of the population through the secondary schools, especially the modern schools. The grammar and technical secondary schools have their curricula dictated to a large extent by the syllabuses of the examinations for which they prepare their pupils but the modern schools are not bound in this way. They now have more time, in that they have their pupils for an extra year or more, and in them the emphasis is on matters of everyday interest of which, surely, lighting is a very good example. The very successful lectures to schoolchildren which have been given by members of the Society at a number of centres are a definite move in the right direction but what I have in mind is a rather more sustained and certainly a much more widespread effort on the part of the teachers, backed by the Society. Within a comparatively short time we may expect that most modern secondary schools will be equipped with film strip projectors and I should like to see the Society prepare a number of lessons on the elementary principles of good lighting, illustrated with film strips. I should be very surprised if such a project did not receive active encouragement from the Ministry of Education.

It might be possible to go even further in certain schools. It is the Ministry's expectation that different modern secondary schools will develop along somewhat different lines, depending on the individual enthusiasms of members of the staff and I can quite well imagine that here and there teachers will be found who recognise lighting as a subject which can be presented in an interesting way. Given encouragement in the form of a simple book or booklet on the subject they could develop it in a series of lessons with practical demonstrations and even, perhaps, in some cases with practical work by the scholars.

This, however, is frankly a digression from my main theme and, after asking your forgiveness, I want to conclude with a word to the would-be illuminating engineer himself. I suppose there is no professional man worthy of the name who would not think it incumbent upon him to issue a warning to anyone who proposed to enter his profession. The illuminating engineer is no exception to this rule. He *must* point out that the ranks are not numerous and that opportunities do not abound; they have to be sought and, still more important, they can only be seized by the man who has prepared himself by long, careful and well directed training. Unless he is prepared for the kind of course which I endeavoured to sketch out in the earlier part of my Address, the would-be entrant had better seek some other career.

On the other hand, it would be difficult to find a subject which offers more of interest to anyone who is prepared for the necessary discipline. The number of subjects with which the lighting engineer must have more than a nodding acquaintance is large and in the course of his practice he is likely to be brought into contact with men of many other professions—a very stimulating experience. Finally, he will find in the lighting world in general and in this Society in particular, a spirit of co-operation which, I venture to believe is second to none in any profession. As Mr. Dow so well expressed it: "whenever there is a task to be done our members and the firms who employ them are willing to forget their personal interests and predilections and to pool their efforts for the common good."

I cannot do better than conclude on this note. That spirit has enabled us to carry on through the difficult days and I am confident that it will be with us in ever-increasing measure in the years that lie before us. We look forward to going on from strength to strength, welcoming to our ranks equally the professional lighting engineer and the layman, that both may join in our great aim of spreading illumination and the "knowledge relating thereto."

SESSIONAL MEETING IN LONDON

The opening meeting of the session took place at the School of Hygiene and Tropical Medicine (Keppel-street, London, W.C.1), on Tuesday, October 14, 1947, at 6 p.m.

The retiring President, Mr. J. S. Dow, being in the chair, called upon Dr. J. W. T. Walsh to deliver his presidential address, entitled "The Training of the Illuminating Engineer." Dr. Walsh referred to the need which had arisen for some hallmark of the competent lighting engineer, saying that there were many problems associated with the granting of such a distinction by the Society though fortunately a satisfactory compromise had been found in the Register of Lighting Engineers. Dr. Walsh dealt with the requirements which the Society might well demand of applicants for this distinction, and made suggestions regarding courses of training. He referred to the necessity for adequate practical training, and concluded with some advice to those entering the profession.

A vote of thanks to the new President was proposed by Mr. R. O. Ackerley, who said that he felt it a great privilege to be called upon for the pleasant duty of commenting on Dr. Walsh's presidential address. The training of the lighting engineer was of the greatest interest to all members, and though the new hallmark was a very good thing, he was glad to think that the Society would continue for many years to come to open its doors to anyone interested in lighting. He also hoped that the time would soon come when the professional institutions would include lighting as one of the sections in which candidates might obtain their graduateships.

The vote of thanks was seconded by Mr. C. E. Greenslade, who recalled that during the war years it had been very difficult to maintain interest in the City and Guilds examinations, and entries had been very few. Last year, however, nearly fifty students had passed the intermediate examination, and this year, now that there were courses in London, Leeds, Cardiff, Glasgow, Birmingham, and Manchester, the numbers sitting for the examination would be greatly increased. Thanks were due to the new president for the textbook on illuminating engineering, which he had written, and which would greatly simplify the teachers' task. The vote of thanks was passed with acclamation.

Before vacating the chair, Mr. Dow said that though his year of office had been comparatively uneventful, the only task now left to him was one of particular interest. For the first time in the history of the Society a member had been invited to become President for a second time, Dr. Walsh having previously been President in 1929. Dr. Walsh needed no introduction, and Mr. Dow said he felt very happy at handing over to such a worthy successor.

Dr. Walsh then took the chair, and returned thanks for the vote of thanks, and the retiring President's introduction. He said that he found it difficult to express his great appreciation for the honour that had been done to him in being elected President for a further term of office. The task of President was not as easy as it had been when he first held that office, but he knew that during his year he would have many good friends to assist him, particularly Mr. Dow, who had done so much in the past to bring the Society to its present state of prosperity.

The President then announced that the Council had decided that the award of the Leon Gaster Memorial Premium for the past year should be made to Mr. J. S. Smyth, for his paper entitled "The Brightness and Legibility at Night of Road Traffic Signs." Mr. Smyth was unfortunately unable to be present at the meeting to receive the award. This terminated the meeting.

PROVISIONAL SYLLABUS OF MEETINGS

(SESSION 1947—1948)

SESSIONAL AND INFORMAL MEETINGS AND VISITS IN LONDON

1947.

Tuesday, Oct. 14th. Sessional Meeting. Address by the President (Dr. J. W. T. WALSH). (*To be held at the School of Hygiene and Tropical Medicine, Keppel Street* (*Gower Street*), *London, W.C.*1.) **6 p.m.**

Tuesday, Oct. 28th. Visit to the Research Laboratories of the General Electric Company, Limited, Wembley. 2.15 p.m.

Tuesday, Nov. 11th. Sessional Meeting. Design of Industrial Lighting Equipment, by Mr. F. WIDNALL. (*To be held at the Lighting Service Bureau, 2, Savoy Hill, London, W.C.*2.) **6 p.m.**

Tuesday, Nov. 25th. Informal Meeting. Lecture on Recent Advances in the Physiology of Vision, by Prof. H. HARTRIDGE. To be followed by a discussion. (*To be held at the Lighting Service Bureau, 2, Savoy Hill, London, W.C.*2.) **6 p.m.**

Tuesday, Dec. 9th. Sessional Meeting. Colour and Lighting in Industry, by Dr. J. H. NELSON. (*To be held at the Lighting Service Bureau, 2, Savoy Hill, London, W.C.*2.) **6 p.m.**

1948.

Tuesday, Jan. 13th. Sessional Meeting. High Speed Photography, by Dr. J. W. MITCHELL. (*To be held at the Lighting Service Bureau, 2, Savoy Hill, London, W.C.*2.) **6 p.m.**

Tuesday, Feb. 10th. Sessional Meeting. The Illumination of Architecture, by Mr. G. GRENFELL BAINES. (*Joint Meeting with the R.I.B.A. To be held at the School of Hygiene and Tropical Medicine, Keppel Street* (*Gower Street,*) *London, W.C.*1.) **6 p.m.**

Tuesday, Feb. 24th. Informal Meeting. Discussion:—That good artificial lighting is an adequate substitute for natural lighting. Proposers, Mr. R. O. ACKERLEY and Mr. N. SIZER. Opposers, Mr. P. V. BURNETT, Mr. W. A. ALLEN. (*To be held at the Lighting Service Bureau, 2, Savoy Hill, London, W.C.*2.) **6 p.m.**

Tuesday, Mar. 9th. Sessional Meeting. High Voltage Fluorescent Light Sources, by Mr. H. G. JENKINS and Mr. J. N. BOWTELL. (*To be held at the Lighting Service Bureau, 2, Savoy Hill, London, W.C.*2.) **6 p.m.**

Tuesday, Mar. 23rd. Visit to the Plastics Division of Imperial Chemical Industries Limited, Welwyn Garden City. 2.0 p.m.

Tuesday, April 13th. Sessional Meeting. Two papers on **Film Studio Lighting,** by Mr. F. S. HAWKINS and Mr. W. R. STEVENS, and Mr. F. V. HAUSER. (*To be held at the Lighting Service Bureau, 2, Savoy Hill, London, W.C.*2.) **6 p.m.**

June 16th–19th. Summer Meeting and Annual General Meeting at Harrogate.

During the course of the session it is also hoped to arrange a visit to a film studio in the vicinity of London, and also to a Kent coalmine to see an installation of fluorescent lighting.

BATH AND BRISTOL CENTRE [WESTERN AREA]

(*Hon. Secretary:* R. S. HAZELL, c/o The General Electric Co., Ltd., Lawford Street, Old Market, Bristol, 2.)

Meetings will be held alternately at Electricity Showrooms, Bath, and Radiant House, Bristol, at **7 p.m.**

1947.

Oct. 2nd. Address by the Chairman (MR. E. A. NEWBURN). (*At Electricity Showrooms, Bath.*)

Nov. 7th. Film Night—Lamp Manufacture and Street Lighting. (*At Radiant House, Bristol.*)

Dec. 5th. Shop and Store Lighting, by Mr. F. JAMIESON. (*At Electricity Showrooms, Bath.*)

1948.

Jan. 2nd. Lighting for Effect, by Mr. T. O. FREETH. (*At Radiant House, Bristol.*)

Feb. 6th.

Mar. 5th.

April 2nd. High Voltage Fluorescent Light Sources, by Mr. H. G. JENKINS and Mr. J. N. BOWTELL. (*At Electricity Showrooms, Bath.*)

May 7th. Address by the President (Dr. J. W. T. WALSH). (*At Radiant House, Bristol.*)

BIRMINGHAM CENTRE [MIDLAND AREA]

(*Hon. Secretary:* W. J. P. WATSON, 91, Brandwood Road, Kings Heath, Birmingham, 14.)

Meetings, unless otherwise stated, will be held at the Imperial Hotel, Temple Street, Birmingham, at **6 p.m.** *Tea Buffet,* **5.30 p.m.**

1947.

Sept. 26th. Special Meeting at Rugby.

Oct. 3rd. "Ladies Night" (Buffet Dance). (*To be held at the Crown and Cushion Hotel, Perry Barr, Birmingham.*)

Oct. 17th. Address by the Chairman (Mr. C. J. ALLDERIDGE).

Nov. 7th. High Voltage Fluorescent Light Sources, by Mr. H. G. JENKINS and Mr. J. N. BOWTELL. (*Joint Meeting with the Institution of Electrical Engineers and the Electrical Contractors Association. To be held at Messrs. Joseph Lucas, Limited, Farm Street, Birmingham.*)

Dec. 5th. Discussion:—"Lighting and Industrial Decoration," by Mr. ARTHUR L. HALL and Mr. STUART D. LAY. (*Joint Meeting with Institution of Production Engineers.*)

1948.

Jan. 9th. Annual Dinner.

Jan. 16th. Recent Applications of High Speed Flash Discharge Tubes, by Mr. C. R. BICKNELL.

Feb. 27th. Annual General Meeting and Address by the President (Dr. J. W. T. WALSH).

Mar. 12th. Church Lighting, by Mr. W. J. P. WATSON.

April 9th. Mine Lighting, by Mr. F. WIDNALL.

April 30th. Lighting for Effect, by Mr. T. O. FREETH. **7 p.m.**

CARDIFF CENTRE [SOUTH WALES AREA]

(*Hon. Secretary:* N. D. HOUSTON, **54**, St. Mary Street, Cardiff.)

1947.

Oct. 6th. Shop and Store Lighting, by Mr. F. JAMESON. (*Joint Meeting with Chambers of Trade and Commerce. To be held at Cardiff Corporation Demonstration Theatre.*) **5.30 p.m.**

Nov. 6th. Lighting and Safety in Factories, by Mr. L. C. RETTIG. (*Joint Meeting with the Royal Society for Prevention of Accidents. To be held at the Mackworth Hotel, Swansea.*) **3.15 p.m.**

Dec. 4th. Stage and Colour Lighting, by Mr. L. G. APPLEBEE. (*Joint Meeting with the Electrical Association for Women. To be held at Cardiff Corporation Demonstration Theatre.*) **6.30 p.m.**

1948.

Jan. 7th. Address by the President (Dr. J. W. T. WALSH). (*To be held at the Cardiff Corporation Demonstration Theatre.*) **6.30 p.m.**

Feb. 5th. Future Trends of Fluorescent Lighting, by Mr. H. L. TREDREE. (*To be held at the Cardiff Corporation Demonstration Theatre.*) **3.30 p.m.**

Mar. 8th.–11th. Lectures to Newport Schools. (*To be held at the Newport Town Hall Assembly Room.*) **10.30 a.m.** and **2.30 p.m.** daily.

April 8th. Annual Luncheon. (*To be held at the Angel Hotel, Cardiff.*) **12.30 p.m.** for **1 p.m.**

Highways Lighting, by Mr. J. B. S. SMYTH. (*Special Meeting with Engineers of Local Government Authorities and Supply Companies. To be held at Cardiff Corporation Demonstration Theatre.*) **3.15 p.m.**

May 6th. A Discussion on Mine Lighting. (Details to be arranged.) (*To be held at the Treforest School of Mines.*) **3.15 p.m.** Followed by **Annual General Meeting.**

EDINBURGH CENTRE [SCOTTISH AREA]

(*Hon. Secretary:* S. G. BATT, 8, George Street, Edinburgh, 2.)

Meetings will be held at the Heriot-Watt College, Chambers Street, Edinburgh, at **6.30 p.m.** *unless otherwise stated.*

1947.

Oct. 22nd. Training for Illuminating Engineering by Mr. F. M. HALE.

Nov. 21st. The Operation, Maintenance and Servicing of Fluorescent Lamps, by Mr. W. A. R. STOYLE at **7 p.m.** (*Joint meeting with the Edinburgh Electrical Society.*)

Dec. 19th. Mines Lighting by Mr. F. WIDNALL. (*Joint Meeting with the Association of Mining, Electrical and Mechanical Engineers, Lothian Branch.*)

1948.

Jan. 16th. High Voltage Fluorescent Lighting by Mr. H. G. JENKINS and Mr. J. N. BOWTELL. (*Joint Meeting with the Royal Scottish Society of Arts.*)

Feb. 20th. The Lighting of Churches by Mr. W. T. SOUTER.

Mar. 19th. Annual General Meeting followed by an **Address** given by the PRESIDENT (Dr. J. W. T. WALSH).

GLASGOW CENTRE [SCOTTISH AREA]

(*Hon. Secretary:* A. M. RANKIN, 29, St. Vincent Place, Glasgow, C.1.)

Meetings will be held at the Institution of Engineers and Shipbuilders in Scotland, 39, Elmbank Crescent, Glasgow, C.3, at **6 p.m.**

1947.

Oct. 2nd. Hot Cathode Fittings Design and Circuits, by Mr. J. PEARSE and Mr. R. E. EDINBOROUGH.

Nov. 27th. The Place of Science in the Art of Lighting, by Mr. R. O. ACKERLEY and Mr. ALISTER MACDONALD.

Dec. 18th. The Development of Fluorescent Lighting in Mines, by Mr. F. WIDNALL.

1948.

Jan. 15th. High Voltage Fluorescent Lighting, by Mr. H. G. JENKINS and Mr. J. N. BOWTELL.

Feb. 19th. Textile Lighting, by Mr. T. S. JONES.

Mar. 18th. Annual General Meeting followed by an Address by the President (Dr. J. W. T. WALSH, **and Annual Dinner.**

LEEDS CENTRE [NORTH MIDLAND AREA]

(*Hon. Secretary:* ERIC SMITH, 28, *St. Paul's Street, Leeds.*)

Meetings will be held at the Leeds Corporation Electricity Dept., Whitehall Road, Leeds, at **6 p.m.**

1947.

Oct. 7th. Address by the Chairman (Mr. E. A. FOWLER).

Nov. 3rd. Colour, by Mr. H. E. CARRINGTON.

Dec. 1st. Black Light, by Mr. H. R. RUFF and Mr. I. G. FOWLER.

1948.

Jan. 5th. Joint North Midland Area Meeting at Leeds.

Feb. 2nd. Mine Lighting, by Mr. S. W. RICHARDS.

Mar. 2nd. Present Trends in Daylight Studies, by Mr. W. ALLEN.

April 5th. Annual General Meeting followed by an Address given by the President (Dr. J. W. T. WALSH).

LEICESTER CENTRE [MIDLAND AREA]

(*Hon. Secretary:* W. N. COULSON, 5, Campbell Street, Leicester.)

Meetings will be held at the Corporation of Leicester Electricity Department Demonstration Theatre, Charles Street, Leicester, at **6.30 p.m.**

1947.

Oct. 1st. Annual Dinner. (*To be held at the Bell Hotel.*)

Oct. 9th. Lighting of Old Buildings, by Mr. S. C. ANDERSON.

Nov. 13th. Railway Lighting, by Mr. A. CUNNINGTON.

Dec. 11th. Cold Cathode Fluorescent Lighting Installations, by Mr. C. DYKES-BROWN.

1948.
Jan. 8th. **Lighting for Photography,** by Mr. G. A. JONES.
Feb. 12th. **Home Lighting,** by Mr. T. O. FREETH.
Mar. 11th. **Television,** by Mr. J. T. THORNTON.
April 8th. **Lighting Maintenance,** by Mr. C. HURD.
April 29th. **Works Visit.** (Details to be announced.)
May 13th. **Annual General Meeting.**
June 24th. **Summer Outing.** (Details to be announced.)

LIVERPOOL CENTRE [NORTH WESTERN AREA]

(*Hon. Secretary:* K. R. MACKLEY, 24, Dale Street, Liverpool, 2.)
Meetings will be held in the Liverpool Corporation Electricity Showrooms, Whitechapel, Liverpool, at **6 p.m.**

1947.
Oct. 21st. **The Evolution of an Electric Lamp,** by Dr. J. N. ALDINGTON.
Nov. 18th. **Light for Selling,** by Mr. J. K. FRISBY.
Dec. 9th. **Fluorescent Lamps and Lighting,** by Mr. C. R. BICKNELL.
1948.
Jan. 13th.
Feb. 10th. **Colour in Industry,** by Dr. J. H. NELSON.
Mar. 9th. **Lighting Problems in a Sugar Refinery,** by Mr. F. W. WHITE.
April 6th. **Lighting for Photography,** by Mr. G. A. JONES.

MANCHESTER CENTRE [NORTH WESTERN AREA]

(*Hon. Secretary:* W. E. BALLARD, Magnet House, Victoria Bridge, Manchester, 3.)
Meetings will be held in the Reynolds Hall, College of Technology, Sackville Street, Manchester, at **6 p.m.**, *unless otherwise stated.*

1947.
Oct. 2nd. **Glass,** by Dr. R. E. BASTICK. (*Joint Meeting with the Institute of Physics. Manchester and District Branch.*) **6.30 p.m.**
Nov. 6th. **The Evolution of an Electric Lamp,** by Dr. J. N. ALDINGTON. (*Joint Meeting with the Institution of Electronics, North-Western Branch.*) **6.30 p.m.**
Dec. 4th. **Industrial Lighting,** by Mr. W. IMRIE-SMITH.
1948.
Jan. 7th. **The Lighting of Housing Estates,** by Mr. E. J. STEWART. (*Joint Meeting with the Association of Public Lighting Engineers.*)
Feb. 5th. **Lighting for Effect,** by Mr. T. O. FREETH. (*Joint Meeting with the Electrical Association for Women, Manchester and Salford District Branch.*)
Mar. 18th. **School Lighting,** by Mr. T. S. JONES.
April 15th. **New Lamps—New Uses and New Lighting Techniques,** by H. R. RUFF.

NEWCASTLE CENTRE [NORTH EASTERN AREA]

(*Hon. Secretary:* A. J. OGLE, Carliol House, Newcastle upon Tyne.)
Meetings will be held in the Minor Durant Hall, Oxford Street, Newcastle upon Tyne, at **6.15 p.m.**

1947.
Oct. 1st. **Address by the Chairman** (Mr. C. FIELDING).
Nov. 5th. **The Design of Lanterns—Aesthetic and Practical Considerations,** by Dr. S. ENGLISH.
Dec. 3rd. **Some Impressions of Lighting in the U.S.A.** by Mr. A. G. PENNY.
1948.
Jan. 7th. **Annual Dinner.**
Feb. 4th. **Light and Colour in Play Production,** by Mr. P. CORRY.
Mar. 3rd. **Colour and Lighting in Industry,** by Dr. J. H. NELSON.
April 7th. **Address by the President** (Dr. J. W. T. WALSH). **Annual General Meeting.**

NOTTINGHAM CENTRE [EAST MIDLAND AREA]

(*Hon. Secretary:* A. HACKING, 32, St. Leonards Drive, Wollaton, Nottingham.)

Meetings will be held in the City of Nottingham Gas Dept. Demonstration Theatre, Parliament Street, Nottingham, at **5.30 p.m.**

1947.

Oct. 3rd. Address by the Chairman (Mr. J. C. CHARITY).

Nov. 7th. Application of Polarised Light, by Dr. J. WARD.

Dec. 5th. Debate:—"That the use of Fluorescent Lighting is not in the interest of the public."

1948.

Jan. 9th. Lighting the Home, by Mr. T. O. FREETH.

Feb. 6th. Industrial Light and Colour, by Mr. T. S. JONES.

Mar. 5th. Lighting for Photography, by Mr. G. A. JONES.

SHEFFIELD CENTRE [NORTH MIDLAND AREA]

(*Hon. Secretary:* D. H. Fox, Howard Gallery, Chapel Walk, Sheffield.)

Meetings, unless otherwise stated, will be held in the Medical Library, The University, Western Bank, Sheffield, 10, *at* **6 p.m.** *Tea* **5.30 p.m.**

1947.

Oct. 13th. School Lighting, by Mr. G. B. GIBBONS. (*To be held at Woodthorpe Secondary School.*)

Nov. 3rd. Cold Cathode Tubes, by Mr. S. ANDERSON.

Dec. 1st. Lighting in the Home, by Mr. T. O. FREETH. (*Joint meeting with the Sheffield Electrical Association for Women.*)

1948.

Jan. 5th. Joint North Midland Area Meeting. (*To be held at Leeds.*)

Feb. 2nd. Lighting of Retail Stores, by Mr. L. H. HUBBLE.

Mar. 1st. Present Trend in Daylight Studies, by Mr. W. ALLEN.

April 26th. Annual General Meeting. Colour of Discharge Lamps, by Dr. H. COTTON.

BRADFORD GROUP [NORTH MIDLAND AREA]

(*Joint Hon. Secretaries:* A. J. HUTCHISON, 45–53, Sunbridge Road, Bradford. W. H. NAYLOR, 40, Godwin Street, Bradford.)

Meetings will be held in Bradford Corporation Electricity Offices, Sunbridge Road, Bradford, at **7.30 p.m.**

1947.

Sept. 25th. Lighting in R.M.S. Queen Elizabeth, by Mr. T. CATTEN.

Oct. 23rd. To be arranged.

Nov. 20th. Light and Colour in Play Production, by Mr. P. CORRY.

Dec. 18th. To be arranged.

1948.

Jan. 15th. Power Factor and the Lighting Engineer, by Dr. E. C. WALTON.

Feb. 12th. Lighting Problems in Cinema Studios, by Mr. J. B. S. SMYTH.

Mar. 11th. Industrial Lighting and Colour, by Mr. T. S. JONES.

April 8th. Lighting for Effect, by Mr. T. O. FREETH.

EXETER GROUP [WESTERN AREA]

(*Hon. Secretary:* L. W. CORNISH, 46, North Street, Exeter.)

1947.

Oct. 1st. **The Fundamentals of Illumination,** by Mr. E. B. SAWYER.

Nov. 6th. **Film Night.**

Dec. 4th. **Shop and Store Lighting,** by Mr. F. JAMIESON.

1948.

Jan. 1st. **Lighting for Effect,** by Mr. T. O. FREETH.

May 7th. **Address by the President** (Dr. J. W. T. WALSH). (*Joint Meeting with the Bath and Bristol Centre at Bristol.*)

HUDDERSFIELD GROUP [NORTH MIDLAND AREA]

(*Hon. Secretary:* E. WOOD, 11, Long Grove Avenue, Dalton, Huddersfield.)

Meetings will be held in the Electricity Showroom, Market Street, Huddersfield, at **7 p.m.**

1947.

Oct. 3rd. **New Lighting for Old Buildings,** by Mr. S. ANDERSON and Mr. E. H. PENWARDEN.

Nov. 7th. **Store and Display Lighting,** by Mr. D. C. JAMES.

Dec. 2nd. **Black Light,** by Mr. H. R. RUFF and Mr. I. L. FOWLER.

1948.

Jan. 9th. **Industrial Lighting—Planned Maintenance,** by Mr. C. F. HURD.

Feb. 6th. **Practical Aspects of Interior Lighting Installations,** by Mr. E. A. FOWLER.

Mar. 5th. **Cold Cathode Fluorescent Lighting Installations,** by Mr. C. DYKES-BROWN.

April 9th. **Lighting for Effect and Interior Decoration,** by Mr. T. O. FREETH. (*Joint Meeting with the Electrical Association for Women.*)

April 30th. **Colour and Lighting in Industry,** by Dr. J. H. NELSON.

STOKE ON TRENT GROUP [MIDLAND AREA]

(*Hon. Secretary:* J. P. OLIVER 31, Kingsway, Stoke on Trent.)

1947.

Oct. 21st. **Street Lighting,** by Dr. S. ENGLISH.

Nov. 18th. **Automobile Lighting,** by DR. J. H. NELSON.

Dec. 16th. **Natural Lighting in Factories,** by Mr. J. B. BICKERDYKE.

1948.

Jan. 13th. **Colliery Lighting,** by Mr. F. JAMIESON.

TEES-SIDE GROUP [NORTH EASTERN AREA]

(*Hon. Secretary:* J. M. SANDFORD, Magnet House, Corporation Road, Middlesbrough.)

Meetings will be held in the Cleveland Scientific and Technical Institution, Corporation Road, Middlesbrough, at **6.15 p.m.** *Tea* **5.30 p.m.**

1947.

Oct. 22nd. **Lighting in the Home,** by Mr. T. O. FREETH.

Nov. 19th. **Address by the Chairman** (Mr. H. DICKINSON).

Dec. 17th. To be arranged.

1948.

Jan. 21st. **Cold Cathode Fluorescent Lighting,** by Mr. C. DYKES-BROWN.

Feb. 18th. **Brains Trust.**

Mar. 17th. **Power Factor and the Lighting Engineer,** by Dr. E. C. WALTON.

FURTHER RECOMMENDATIONS TO AUTHORS OF PAPERS FOR PRESENTATION BEFORE THE SOCIETY

(1) Introduction

These notes are intended to furnish guidance on the Presentation of Papers and are supplementary to those already published dealing with their Preparation.*

(2) Presentation of Papers

There is more in the presentation of a paper than the mere setting forth of information. The form and phrasing suitable for printing is quite different from that most acceptable for spoken presentation. In particular the capacity of an audience to take in matter read to them is far less than the capacity of an interested reader to absorb a printed record.

The author, therefore, should present at the meeting a specially prepared version, in general much shorter than the printed paper and *written for speaking*—not merely shortened by the excision of certain paragraphs.

The author may read from script, or speak from notes. The ideal address, in which the author proceeds clearly and logically within his allotted time, apparently without notes, can only be achieved after long practice. In general authors would do well to use a carefully prepared script, conveniently typed in double spacing on foolscap sheets; the reading of this should be well rehearsed so that the speaker no longer finds it necessary to keep his eyes continuously on the text and the audience receives the impression that the matter is being "spoken" rather than "read."

It has been previously suggested† that the reading of papers should not occupy more than 30-40 minutes. Speakers would do well to adopt a rate of reading not exceeding one hundred words a minute.

(3) Collaboration of Joint Authors

Where a paper is the work of several authors the presentation is sometimes shared, each author speaking on one section. This procedure usually requires careful preparation and is best adopted when the material consists of several well defined divisions. The aim, however, should be to secure the best

---

* Trans. Illum. Eng. Soc. (London), Vol. X, No. 9, September, 1945.

† Loc. cit.

presentation to the audience rather than to give each author an opportunity to speak.

It is not unusual for one of the authors of a joint paper to deliver it, and for the other to reply to the discussion; though on occasion it may be expedient to divide the task of replying, each author dealing with matters on which he has special knowledge.

(i) Illustrations

There is an art in the use of illustrations, whether verbal, or by slides or demonstrations. Such illustrations may add greatly to the interest of the paper. They are, however, intended *to illustrate*. They should not "steal the show" but should arrive inevitably from the authors' argument and should serve to clinch it.

Attention has already been drawn to the desirability of adopting only such illustrations as can be readily seen and understood by the audience as a whole.‡ In particular, lantern slides should be clear and legible and the display of detailed diagrams and tables should in general be avoided. Slides and demonstrations should be distributed fairly evenly throughout the paper. It is usually inadvisable to defer them until the end as this involves recapitulation and breaks the flow of the argument.

‡ Loc. cit.

Additions to List of Members

The following applicants have been duly elected by the Council to membership in the Society, and their names have been added to the list of members:—

SUSTAINING MEMBERS:—

Willey and Co., Ltd. .....*Representative*: Mr. W. E. Browning.
Haven Road, EXETER.

CORPORATE MEMBERS:—

Balaam, N. B. .....12, Rydal Road, LONDON, S.W.16.
Bates, N. G. .....36, Gravelly Hill North, Erdington, BIRMINGHAM.
Beckett, D. R. .....39, Prospect Park, EXETER.
Bedford, W. H. .....Nuneaton Staff College, Green Lane, NUNEATON.
Britton-Johnson, M....21, St. Helena Road, Westbury Park, BRISTOL.
Brown H. H. .....11-13, Southernhay East, EXETER.
Charlesworth, G. E....c.o. Lighting Dept., Philips Electrical, Ltd., Century House, Shaftesbury Avenue, W.C.2.
Davis, K. .....Hunter's Drive, Penkhull, STOKE-ON-TRENT.

Douglas, B. M. ..... 55, Astill Drive, LEICESTER.
Evans, E. V. ..... 6, Victoria Avenue, Sneinton Dale, NOTTINGHAM.
Everatt, R. ..... c.o. Hubert Davies and Co., Ltd., P.O. Box 720, Port Elizabeth, SOUTH AFRICA.
Frazer, G. ..... "Gai Logis," 180, The Long Shoot, NUNEATON.
Gaunt, W. E. ..... 121, Stockport Road, Altrincham, CHESHIRE.
Gimson, C. E. ..... Electrical Engineering Dept., University College, NOTTINGHAM.
Graham, K. ..... 13, Prestwick Gardens, Kenton Road, NEWCASTLE-ON-TYNE.
Green, A. H. ..... 37, All Saints Terrace, CHELTENHAM.
Harse, H. F. ..... 22, North Avenue, Polsloe Road, EXETER.
Haylor, K. F. ..... 67, Lyncroft Road, Hall Green, BIRMINGHAM.
Holdsworth, G. A. ... 3, Cross Avenue, Prestwich, MANCHESTER.
Jarvis, P. J. E. ..... 10, Finsen Road, London, S.E.5.
Johnson, E. W. ..... 47, Delamere Road, Gatley, CHESHIRE.
Keet, A. L. ..... Electricity Offices, 46, North Street, EXETER.
Key, A. M. ..... 23, Broughton Drive, Wollaton Park, NOTTINGHAM.
Kirby, J. ..... 22, Laurel Road, STOCKTON-ON-TEES.
Knopp, L. ..... 3, Harewood Road, South Croydon, SURREY.
Laycock, E. V. ..... 30, Springwood Avenue, HUDDERSFIELD.
Lockwood, M. G. ..... 12, James Andrew Crescent, Greenhill, SHEFFIELD.
Lynes, J. A. ..... 2, Leinster Mansions, Finchley Road, LONDON, N.W.3.
Malon, G. V. ..... 25, Netherton Road, St. Margarets, MIDDX.
Maskery, W. ..... Baden Hall, Eccleshall, STAFFS.
Mogridge, G. S. ..... 41, Bagshot Avenue, EXETER.
Mort, R. ..... 1, St. James' Street, SHEFFIELD.
Mortimer, W. H. ..... 174, Monks Road, EXETER.
Mutch, D. E. ..... 127, Balgores Lane, Romford, ESSEX.
Robinson, S. ..... Thorn Electrical Industries, Ltd., Stevenson Square, Manchester.
Steven, W. ..... 201, Crowhill Street, GLASGOW.
Summers, E. W. ..... 84, Belvedere Road, Bexleyheath, KENT.
Tree, F. G. W. ..... 29, Victoria Park Drive, South, GLASGOW.
Walton, R. ..... c.o. British General Electric Co., Ltd., P.O. Box 845, Salisbury, SOUTHERN RHODESIA.
Waterhouse, C. R. ..... Rayalf Works, 156, Rockingham Lane, SHEFFIELD.
Watson, H. I. C. ..... 10, Gladstone Road, Watford, HERTS.
Webster. R ..... 115, Morningside Road, LIVERPOOL.
Wells, O. B. ..... 42, Abbeydale Road South, SHEFFIELD.
Wiard, E. L. ..... Downes & Davies, Ltd., 1-9, Stanley Street, LIVERPOOL.
Woods, T. D. ..... Downes & Davies, Ltd., 1-9, Stanley Street, LIVERPOOL.

COUNTRY MEMBER:—
Sundararaman, R. ..... "Iretons," Springfield Road, Chelmsford, ESSEX.

STUDENTS:—
Hedderly, G. ..... "St. Leonards," Castle Road, Tipton, STAFFS.
Newbery, D. F. J. ..... 15, Brandwood Road, Kings Heath, BIRMINGHAM.